

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

United States Patent and Trademark  
Office  
(Box PCT)  
Crystal Plaza 2  
Washington, DC 20231  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

<b>Date of mailing</b> (day/month/year) 28 October 1996 (28.10.96)	
<b>International application No.</b> PCT/US95/02128	<b>Applicant's or agent's file reference</b> IVERSON 04
<b>International filing date</b> (day/month/year) 17 February 1995 (17.02.95)	<b>Priority date</b> (day/month/year)
<b>Applicant</b> IVERSON, Thomas, Jr. et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
05 September 1996 (05.09.96)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No.: (41-22) 740.14.35</p>	<p>Authorized officer</p> <p>Carlos Roy</p> <p>Telephone No.: (41-22) 730.91.11</p>
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## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 06 JUN 1997

WIPO PCT

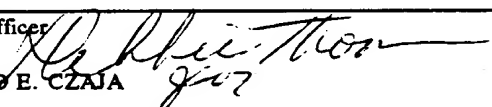
Applicant's or agent's file reference IVERSON 04	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US95/02128	International filing date (day/month/year) 17 FEBRUARY 1995	Priority date (day/month/year) NONE
International Patent Classification (IPC) or national classification and IPC IPC(6): A23B 07/14, 07/153 and US Cl.: 426/478; 252/187.21		
Applicant CH <sub>2</sub> O INCORPORATED		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  05 SEPTEMBER 1996	Date of completion of this report  13 MAY 1997
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer  DONALD E. CZAJA
Facsimile No. (703) 305-3230	Telephone No. (703) 308-3852

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US95/02128

## I. Basis of the report

1. This report has been drawn on the basis of (Substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments):

- ☒ the international application as originally filed.
- ☒ the description, pages 1-16 , as originally filed.  
pages NONE , filed with the demand.  
pages NONE , filed with the letter of \_\_\_\_\_.  
pages \_\_\_\_\_ , filed with the letter of \_\_\_\_\_.
- ☒ the claims, Nos. 1-28 , as originally filed.  
Nos. NONE , as amended under Article 19.  
Nos. NONE , filed with the demand.  
Nos. NONE , filed with the letter of \_\_\_\_\_.  
Nos. \_\_\_\_\_ , filed with the letter of \_\_\_\_\_.
- ☒ the drawings, sheets/fig 1-3 , as originally filed.  
sheets/fig NONE , filed with the demand.  
sheets/fig NONE , filed with the letter of \_\_\_\_\_.  
sheets/fig \_\_\_\_\_ , filed with the letter of \_\_\_\_\_.

2. The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE .
- ☒ the claims, Nos. NONE .
- ☒ the drawings, sheets/fig NONE .

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the ~~Supplemental Box~~ Additional observations below (Rule 70.2(c)).

4. Additional observations, if necessary:

NONE

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US95/02128

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. STATEMENT**

Novelty (N)	Claims	<u>10-11, 13-28</u>	YES
	Claims	<u>1-9, 12</u>	NO
Inventive Step (IS)	Claims	<u>NONE</u>	YES
	Claims	<u>1-28</u>	NO
Industrial Applicability (IA)	Claims	<u>1-28</u>	YES
	Claims	<u>NONE</u>	NO

**2. CITATIONS AND EXPLANATIONS**

Claims 1-9 and 12 lack novelty under PCT Article 33(2) as being anticipated by Leifheit et al or Lovely.

Each of Leifheit et al or Lovely teach well known method of obtaining chlorine dioxide by reacting a chlorite and an acid, e.g. phosphoric acid, and well known use of a chlorine dioxide to inhibit fungus growth in produce, i.e. fruits or vegetables. Both Leifheit et al and Lovely also teach the importance of controlling various parameters, including pH of the chlorine dioxide solution or the concentration of each of the reactants, i.e. a chlorite or an acid, to obtain the solution having desired physical and functional properties.

Even though neither Leifheit et al nor Lovely provides chlorine dioxide in process water, each of the references clearly teaches the efficacy of chlorine dioxide in inhibiting the growth of fungus in produce. As to the different forms of chlorine dioxide composition, i.e. in a pulverized powder form of Lovely or as a foaming composition of Leifheit et al, different forms of the composition would depend on the intended method of application of such composition for different materials. In addition, it is not only conventional to wash the produce with water to remove debris, but including a fungicidal ingredient in process water or wash water to remove such deterioration-causing agents, e.g. fungi, and other cellular debris on the surface of the produce had been known as taught by Bell (U.S. Patent No. 5,226,972).

In the instant case, since it is chlorine dioxide which is the active fungicidal ingredient, regardless of whether it is provided in a liquid form or pulverized form, it is expected to have the same functional properties of inhibiting the growth of fungus on the produce, and providing it in wash water would at the same time remove the debris.

Claims 10-11 and 14 lack an inventive step under PCT Article 33(3) as being obvious over Leifheit et al or Lovely in view of Mason et al.

(Continued on Supplemental Sheet.)

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 10

**V. 2. REASONED STATEMENTS - CITATIONS AND EXPLANATIONS (Continued):**

Leifheit et al and Lovely are already discussed. Neither Leifheit et al nor Lovely teaches the use sodium chloride or surfactants in their chlorine dioxide solution obtained by reacting a chlorite and an acid, e.g. phosphoric acid.

Mason et al teach that in water treatment the use of chlorine dioxide in combination with chlorine, i.e. sodium chloride, is superior to the use of either separately. In addition, the reference also teaches the use of various agents, e.g. surfactants, including sodium 2-ethylhexyl sulfate and salt of dodecylbenzenesulfonic acid, in a herbicide composition to maintain or increase/enhance the biological activity of various herbicidal compositions, including chlorine dioxide.

It would have been obvious to further add sodium chloride alone or both sodium chloride and surfactants to the solution of either Leifheit et al or Lovely to obtain a solution having better property of inhibiting fungus growth in produce.

Claim 13 lacks an inventive step under PCT Article 33(3) as being obvious over any one of Leifheit et al or Lovely in view of Bakos et al or Mason et al.

Leifheit et al and Lovely are already discussed above.

Neither Leifheit et al nor Lovely teach the use of surfactants such as sodium 2-ethylhexyl sulfate and salt of dodecylbenzenesulfonic acid in their chlorine dioxide solution.

Each of Bakos et al or Mason et al teach the use of various agents, e.g. surfactants, including sodium 2-ethylhexyl sulfate and salt of dodecylbenzenesulfonic acid in a herbicide composition to maintain or increase/enhance the biological activity of various herbicidal compositions, including chlorine dioxide.

It would have been obvious to further add well known surfactants taught by Bakos et al or Mason et al to either Leifheit et al or Lovley's chlorine dioxide solution to obtain the solution having better properties of inhibiting fungus growth in produce.

Claims 10-11 and 13-14 depend on claim 1, and further include different limitations which are met by each of the Mason et al or/and Bakos et al's teachings.

Claims 15-16, 20-23 and 27-28 lack an inventive step under PCT Article 33(3) as being obvious over Leifheit et al or Lovely in view of Keenan et al.

Leifheit et al and Lovely are already discussed.

Leifheit et al or Lovely do not teach the step of monitoring oxidation-reduction reaction involved in obtaining the chlorine dioxide solution.

Keenan et al teach a method of monitoring oxidation-reduction reaction by monitoring oxidation reduction potential in a solution. It would have been obvious to use well known monitoring method conventionally used in an oxidation-reduction reaction as taught by Keenan et al in Leifheit et al or Lovely's solution, since obtaining their solution also involves oxidation-reduction reaction.

Even though each of Leifheit et al or Lovely alone does not teach all the steps in the method as set forth in claims 15 and 22, the deficiency is met by the Keenan et al's reference, which teaches the importance of monitoring the oxidation-reduction reaction, which reaction is also involved in the formation of chlorine dioxide of instant case.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US95/02128

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 11

Claims 17-19 and 24-26 lack an inventive step under PCT Article 33(3) as being obvious over the prior art as applied in the immediately preceding paragraph and further in view of Mason et al.

The references of Leifheit et al, Lovely or Keenan et al do not teach the use of sodium chloride in their solution.

In light of the beneficial effects of further adding chlorine and agents that enhance disinfecting property of chlorine dioxide as taught by Mason et al, it would have been obvious to use such agents in combination with chlorine dioxide obtained by reacting a chlorite and an acid and further employ the conventional method taught by Keenan et al in obtaining the solution while monitoring oxidation reduction potential in the solution.

Claims 17-19 or 24-26 depend on claim 15 or claim 22, respectively, and include further limitations. The limitations set forth in claims 17-19 and 24-26 are met by the secondary reference of Mason et al.

----- NEW CITATIONS -----

US 5,226,972 A (BELL) 13 JULY 1993, see col. 1, lines 50-56.

## INTERNATIONAL SEARCH REPORT

 International application No.  
 PCT/US95/02128

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : A23B 07/14, 07/153

US CL : 426/478; 252/187.21

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 426/478; 252/187.21

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

General Chemistry Textbook

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US, A, 5,126,070 (LEIFHEIT ET AL) 30 June 1992, col. 1, lines 17-18; col. 2, lines 14-18.	1-9, 12 ----- 13, 15-16, 18, 20-23, 25, 27-28
X --- Y	US, A, 3,591,515 (LOVELY) 6 July 1971, columns 1-4, especially col. 1, lines 12-26.	1-9, 12 ----- 13, 15-16, 18, 20-23, 25, 27-28
Y	US, A, 5,072,022 (BAKOS ET AL) 10 December 1991, col. 5, lines 3-11, lines 41-58; col. 6, line 59- col. 7, line 5.	13, 15-16, 18, 20-23, 25, 27-28

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	*T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be part of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*E* earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G* document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

11 MAY 1995

Date of mailing of the international search report

02 JUN 1995

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US95/02128

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4,889,654 (MASON ET AL) 26 December 1989, col. 2, lines 56-66; col. 3, lines 19-24; col. 4, lines 7-23.	10-11, 14, 17, 19, 24, 26
Y	General College Chemistry, 2nd Edition, issued 1961, KEENAN ET AL et al, "Electrochemistry", pages 513-517, especially 513.	15-28



C-12  
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International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup> :</b> <b>A23B 7/14, 7/153</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 96/25049</b> <b>(43) International Publication Date:</b> 22 August 1996 (22.08.96)
<b>(21) International Application Number:</b> PCT/US95/02128 <b>(22) International Filing Date:</b> 17 February 1995 (17.02.95)  <b>(71) Applicant (for all designated States except US):</b> CH2O INCORPORATED [US/US]; 8820 Old Highway 99 S.E., Olympia, WA 98501 (US).  <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> IVERSON, Thomas, Jr. [US/US]; 824 Carriage Hill Drive, Yakima, WA 98908 (US). PRINDLE, Joyce [US/US]; 5142 Heights Lane N.E., Olympia, WA 98506 (US). KEITH, Robert, E. [US/US]; 11507 87th Avenue Court East, Puyallup, WA 98373 (US).  <b>(74) Agents:</b> WIAANT, Teresa, J. et al.; Barnard, Pauly & Bellamy, P.S., P.O. Box 58888, Seattle, WA 98138-1888 (US).		<b>(81) Designated States:</b> CA, JP, MX, NZ, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> METHOD FOR TREATING PRODUCE AND PROCESS WATER  <b>(57) Abstract</b>  The present invention provides a method for treating fresh produce to remove debris and inhibit the growth of fungus on the produce and a method for treating contaminants in process water. According to the present invention, the produce is submerged in process water. An effective amount of a chlorine dioxide solution is admixed with the process water. The chlorine dioxide solution is present in the process water in an amount sufficient to clean substantially all debris from the surface of the produce, inhibit growth of fungus on the produce and treat contaminants in the process water.		